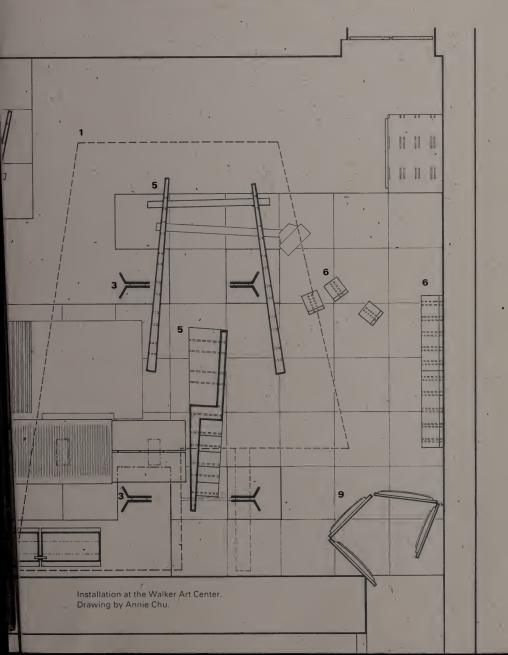
Domestic Arrangements

A Lab Report by Tod Williams and Billie Tsien



Architecture Tomorrow

Walker Art Center, Minneapolis
3 December 1989 — 11 February 1990

Whitney Museum of American Art, Downtown at Federal Reserve Plaza, New York 14 March — 18 May 1990



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This exhibition began with questions. The first questions were: what is meant by the phrase architecture tomorrow? what does such a broad term mean to our work, which is so deliberately specific to each project?; what does it mean for us (or any architect) to show work in a museum?; and how can we seize this opportunity to move closer to an architecture *for* tomorrow?

These questions have led us to consider Architecture Tomorrow as a research project. If we could present this as a report of ongoing research, then we could also consider a question with which we have been struggling for some time. How can our evolving personal philosophy, the way we choose to live, become a more integral part of our work for others?

The house has always been a testing ground for architects. The elements of this exhibition are full-scale pieces of a house. They are not mockups. They are real pieces. Initially we had hoped to build a complete low cost "research" house, but because of budget constraints, spatial requirements of various venues for the exhibition, and obvious functional restrictions in the galleries, we had to forego that possibility. Therefore, we decided to investigate the permutations of specific materials and elements that might have rich implications for house and home in suburban and urban settings.

While low-cost building has not been the primary focus of our past research, it has been an important concern. In this regard, we have been thinking about the re-use of materials: wood pulp, wood chips, and paper products, recognizing that the raw materials for these products may someday be in even shorter supply than they are today. As materials in and of themselves are benign and it is their use that determines their value—another question emerged. How can we make this work significant in its form, even as it is unassuming in its materials?

This research has produced important results Results produce new questions. These (domes-

tic) arrangements are not fixed. They are proposals to see, to reflect upon, and to use. By sharing our research with the public we hope we can subvert the condition in which we all, to some extent, play a part: the elitist marketing of architecture and architects as commodities. Even as we are a part of that world, we hope that Architecture Tomorrow provides an opportunity to alter it. The object of this research is not to create objects to be consumed. The object of this research is use.

1. 2 Roof/Wall

We began by studying two ideas: a series of seg-mented pieces and a solid lightweight mass that could act as a structural whole. After many attempts to develop a hollow segmented system, we chose the concept of the solid segmented mass. The sculptural shape is derived from concerns of structure, construction, and use. It can be sliced like a loaf of bread to accommodate different sizes and situations. Connected and stiffened with a hollow horizontal laminated paper tube, it is a structurally integrated form. Tipped vertically, the same form can provide a wall system that also has its own integral structure.

Using conventional carpentry to produce a form, we made a series of expanded foam segments. These are lightweight, thermally efficient, waterproof, and self-supporting. While we lost the quality of translucency, which was possible in earlier experiments with plastic panels, we gained the properties inherent in the sculpting of a solid mass—carved openings and niches. When used as an exterior wall or roof, the outer surface must be sprayed with an elastomeric coating to protect it from the sun. The interior may remain in its natural state. We have interspersed this material with translucent panels made by sandwiching a thin sheet of packing foam between fiberglass panels.

3 Columns Beams

While researching the roof structure, we uncov-







5 6

ered possibilities for the application of laminated and formed paper. Used to provide protective packing for furniture and as display booths for exhibitions, this material is lightweight, strong, and inexpensive. A wooden mandrel is produced by the factory and then paper is spun and laminated around the form to yield a hollow tube. Although it is possible to produce an original mandrel, in the interest of cost we chose to use an existing shape. By slicing this shape into sections we obtained the pieces we needed to produce the columns and the connecting elements that support the roof.

4 Floor

On a visit to the Smithsonian Institution in Washington, D.C., we saw an exhibition of manufactured objects that represented the technologies of various decades. One of the objects from the 1970s was a pallet on which materials are. loaded to be picked up by forklift. The pallet was made of wood chips mixed with resin and compressed in a mold. It produced a strong shape that was both homely and elegant. We thought at the time that there must be a way to use this technology, which is so obviously an outgrowth of the particleboard commonly used in construction of all kinds today. When we inquired we found that forty-two-inch-square pallets that are capable of carrying 1500 pounds could be purchased for \$5.25 each. To cast and machine a new form would cost about \$30,000. Therefore, again, cost considerations led us to use the pallet in its existing configuration. We bought four of them and began to experiment with surfaces and finishes. It seemed to us that the pallet provided an easy, inexpensive, visually interesting, and transportable way to make a raised floor. We tried a number of filling and surfacing techniques. We experimented with Masonite and paperboard as surfaces, and sand, gravel, sawdust, and resin as fillers.

For the floor surface a perforatéd hardboard was selected. It is similar to pegboard but lighter in

color, made of fine wood particles bound with an adhesive matrix and baked. This gave us a standard floor surface that was easy to apply with mechanical fasteners, and inexpensive. It also allowed a view of the hollow space of the pallet below, and the underside of the pallet could be seen as a subfloor or a ceiling for a space below. In an actual house, the area beneath would provide space for ventilation and locations for utilities.

The filler we liked is a combination of gravel and resin. Although this is a rather "precious" finish—both more labor intensive and more expensive than some of the other options—it is very compelling. It gives the impression of walking on ice, the stones frozen beneath the surface.

5, 6 Interior Walls/Seating

We live in a space that was formerly our studio. The bathroom, which is in the center of the space, is the only room enclosed completely by walls. We can walk a complete circle around it, passing through a living/bedroom, dining/workroom, kitchen, and our son's room. The ability to move continuously without being stopped by dead-end rooms provides a sense of living in a larger space. A certain amount of privacy has been traded for an enlarged sense of space and an arrangement that allows us to feel separate when needed

The walls in the exhibition are arranged so that they shield but do not fully enclose. They are made from layers of Homasote (another fiberboard), laid flat (in a stack 4 feet wide, 12 feet long, and 6 feet high), glued together, and cut to yield various functional shapes. For reasons of weight, economy, and order, certain layers are systematically skipped. Vertical cuts reveal these voids as penetrations through the walls. The Homasote produces a velvet striated texture that, while unassuming, is at the same time sensual. The thickness and weight of the walls allows them to be self-supporting. A series of







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vertical cuts produced the furniture. We searched for an economy of means and material. One cut produced two chairs. There is no waste. The chairs are small and close to the floor. They allow the feet to be planted firmly. Their height corresponds to the height of the table. Like Frank Gehry's cardboard furniture, there are seemingly unlimited unexplored possibilities in this material. We have used and lavered Homasote in a number of ways, but we have just begun to "mine" this solid stack.

7, 8, 9 Table Bed Screen

At home, the bed we made is also our couch. We believe that furniture does not necessarily need to be specialized into single-use objects. The Dutch have "bed stedes." They serve as storage for the bed as well as for bedding. They also may function as bedrooms. In earlier times, the Chinese had bed-heaters: bedding was placed over thick earthen ovens for warmth. It is a luxury to have a long empty table. If such a table were low enough, one could sleep on it as well. In envisioning a new studio for ourselves, ideally we would make a very long, low bed-table. The largest piece of standard inexpensive lumber we could locate was 16 feet long, 2 feet wide, and 3/4 of an inch thick glued-up pine, often used for shelving in closets. Two boards, joined together by clear pine ribs and a perforated hardboard diaphragm, are supported by Homasote bases to provide a table long enough to eat at, draw on, talk over, and sleep on. These same structures turned on edge and hinged may be used to make screens, doors, and partitions.

10 Rug

We have worked for a number of years with the V'soske company on the design of hand-tufted rugs. Incredibly refined, they are also very expensive. We always have been fascinated with the backs of these and with the surface of old rugs where layers have been worn away to reveal the backing. The layers of latex adhered to an open gridded scrim over canvas, both sturdy and beautiful, suggest other applications. For this project we have worked with V'soske to develop a rug that is really the back of a conventional rug. Certain areas are still hand-tufted to provide markings that allude to specific uses. and notations that suggest boundaries: a place to sit (blue); a place to step out of bed (red); the beginning of a path (the rocks); and the entry to the guiet area (the green garden). The areas of tufting are few. They are there to provide a map. The field remains the empty open space of the untufted canvas. We hope that V'soske may one day make inexpensive rugs in this way.

These are the interim results of our research. By no means have we come to definitive conclusions. The search has been frustrating and inspiring. We believe that we have found ways to use materials that uncover aesthetic and functional possibilities. In using inexpensive materials, great care must be taken in putting them together. Consequently, economy of materials was not quite balanced by economy of construction methods. We have not produced · low-cost housing, but we have approached the design of a house that reflects the life and values with which we choose to live.

We have used this opportunity to probe our architectural future.

Tod Williams was educated at Princeton and at Cambridge University in England. He has been an adjunct professor at The Cooper Union, New York since 1974 Billie Tsien is a graduate of Yale and UCLA She, too, has taught at The Cooper Union, as well as at the Parsons School of Design, New York, the Harvard Graduate School of Design, and the Southern California Institute of Architecture, Santa Monica.

1, 2 Roof/Wall

- 3 Columns/Beams
- 4 Floor
- 5, 6 Interior Walls/Séating
- 7, 8, 9 Table/Bed/Screen
- 10 Rug

Credits

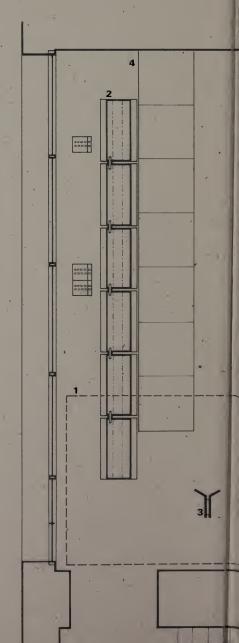
Organized by the Walker Art Center, the exhibition has been conceived and executed with the continuous involvement of Annie Chu. Assistance was provided by Marwan Al-Sayed, Reenie Elliot, Brett Ettinger, Rick Gooding, Stef Kolman, Cathrin Trebeljar, David van Handel of Tod Williams Billie Tsien and Associates, and Steven lino of lino Woodworking.

Construction of the exhibition elements was carried out by members of the Walker Art Center staff under the direction of Mark Kramer

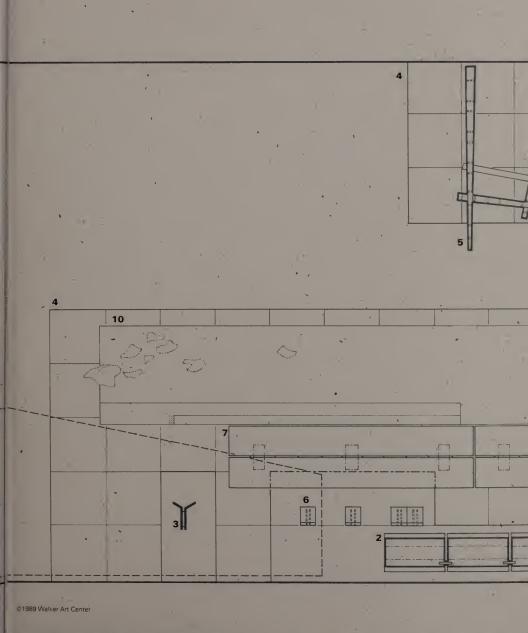
Major funding for Architecture Tomorrow has come from The Jay Chiat Foundation, the Graham Foundation for Advanced Studies in the Fine Arts, and Helen and Kim Whitney. Additional support has been provided by the Homasote* Company, West Trenton, New Jersey, V'soske, New York, and Foam Enterprises, Inc., and Industrial Coatings Co., Inc., both of Minneapolis.

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The exhibition is funded at the Whitney Museum of American Art, Downtown at the Federal Reserve Plaza, by a partnership of Park Tower Realty and IBM, the developers of Federal Reserve Plaza







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Whitney Museum of American Art Downtown at Federal Reserve Plaza 33 Maiden Lane at Nassau Street New York, New York 10038

(212) 943-5657

Hours

Monday-Friday, 11:00-6:00 Saturday, 11:00-3:00 Free admission

Gallery Talks

Monday, Wednesday, Friday, 12:30

This exhibition is part of the ongoing series "Architecture Tomorrow" organized by Mildred Friedman, Design Curator at the Walker Art Center, Minneapolis. Major funding was provided by The Jay Chiat Foundation, the Graham Foundation for Advanced Studies in the Fine Arts, and Helen and Kim Whitney.

The Whitney Museum of American Art, Downtown at Federal Reserve Plaza, is funded by a partnership of Park Tower Realty and IBM, the developers of Federal Reserve Plaza.

REASSESSMENTS TWO SITES

The first "lab report" was written during a period of intense preparation for the project at the Walker Art Center in Minneapolis. Now we have had time to observe the results of that effort and can reconsider what was done. At the Whitney Museum of American Art, Downtown at Federal Reserve Plaza, we confront not only our project but also a space that we have designed. Although the gallery at the Walker Art Center provided a better "laboratory," i.e., little or no intrusion outside the container itself, the delicate balance of neutral and specific space at the Whitney Museum Downtown provides a "charged" atmosphere for our work. A fundamental concept in the design of this museum is the belief that the visitor is not just an observer but a participant. The museum is not a white box; it is an architectural experience that must engage the user viscerally and emotionally. Our installation tries to confront, ignore, highlight, mediate, and use the existing experience. We believe that this will provoke a more emotional and connective result.

Domestic Arrangements does not propose a fixed condition. Architecture only becomes "perfect" through use. This belief may be applied to both our design for the Whitney Museum Downtown and for this installation. Although we intended a full departure in this project from our previous work, it is difficult if not impossible to escape the past. Many aspects of the earlier work reappear and are even reinforced. In the Whitney Museum Downtown and in Domestic Arrangements there is a heightened sense of material and construction. The use of paired or serial forms, structure, scale, order, and details present themselves once again. The perforated structure above the receptionist's desk is reiterated in the perforated hardboard floor and the vertical free-standing screens. The layered floor of wood set upon a terrazzo background is replayed in the resin-andgravel-filled pallets and the latexed canvas. Back-toback aluminum L's are juxtaposed with those of laminated paper supports. The cantilevered aluminum and oak receptionist's desk may be compared with the pine and pegboard table/bed. One wall/stairway addresses another. Each space is defined by a spine: for the Whitney Museum Downtown it is a lighting structure; for *Domestic Arrangements* it is the hovering roof. The sound of water finds its way into the space via Kamal Kozah's video and by appreciation of a found condition within the gallery—a large drainpipe.

MODELS

A.B.C RURAL URBAN SUBURBAN

It was only after we fabricated full-scale mock-ups and actual pieces that we began to investigate their application on a more abstract level. This is an inversion of the usual way architecture is approached—that is, from the sketch or model to full-scale. We made these models with three actual sites in mind—a rural site in California, an urban site in Harlem, and a suburban site in central New Jersey. While the programs were speculative, these proposals employed existing technology, accepted economic constraints, addressed social need, and were specific to each location.

Behind Domestic Arrangements is our belief in a dense and socially interactive human condition. A house in the country is to be occupied at times by several families/individuals/friends. In our design, storage units provide places for personal belongings while the house contains shared objects of use. The urban model embraces an extremely dense urban condition where rooftops are cultivated both literally as gardens and figuratively as child-care centers by the use of lightweight components to provide shelter. Thus wasted space is put to use both socially and environmentally. The suburban condition is where proposals are most speculative. Rezoned front and side yards become sites for additional prefabricated structures to reactivate the streets and provide a structured space for the extended family. Backyards, usually defined by fencing, are instead held jointly as an interior courtyard park. Today's suburban single-family house, while typifying one "ideal," often promotes the isolation and lack of social responsibility that underlie many of the ills of present-day society.

In Domestic Arrangements, we propose not only a reconsideration of certain components of a house, but also the functional and social organization. The extension of this thinking requires re-evaluation of the larger scale components of our physical and social environment.

ENVIRONMENT ELEMENTS

Although environmental issues were not our primary concern, the desire to work with inexpensive and experimental structures brought this topic into focus. There seem to be no ideal answers; rather, there are many paradoxes. Often the processes used to recycle materials were in themselves detrimental to the environment. Chemicals, heat, and resinous binders are often used in recycling. The polyurethane solids are non-biodegradable, and its manufacturing process utilizes a freon coolant, which is harmful to the earth's ozone layer. On the other hand, the foam is inexpensive and lightweight, and its insulative properties can help to conserve the earth's resources. With future research and development (changes in its chemical structure and cooling method are already being developed), it has a potential that can overcome present drawbacks. We also discovered that the foam surface, often coated or concealed for aesthetics and safety, has its own language and "feel." As a solid cellular form that can be cast and carved, foam has intriguing possibilities. Currently used for such diverse applications as false "beams," surfboards, and insulation, this material must be part of our future. Homasote is made from recycled newspaper and paraffin (an odorless and tasteless waxy substance derived from distilled petroleum). Though dimensionally imprecise, it yields a startlingly sensual surface. Used as walls it can provide a warm insulative space. Incorporating colored newsprint offers possibilities for color and texture.

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Although we have used no slow-growing hardwoods, other woods have been employed extensively, which raises an important question: Is it environmentally more satisfactory to use and deplete natural products or to explore new ones (should we use paper or plastic bags for our groceries)? While we strongly believe that as architects we must not lose the freedom for dreams and speculation, we do feel that we must be conscious of the consequences of our decisions. In this way, we become responsible for our actions, and our sociological, political, and cultural role is strengthened.

It is regrettable that we were not able to reconsider the whole house, nor such specific and important conditions as the kitchen, bathroom, the window, and the corner. Moreover, with some of the elements we investigated (the laminated paper columns and the wood chip/resin palette floor structure) very little progress was made in tapping their potential. But the polyurethane roof and wall structure, the latex rug, the pine and hardboard table/bed, the screen, and the Homasote walls and seating elements were rewarding for they provided results of an unexpected dimension. Readily translatable for use today, they seem to be filled with possibilities for tomorrow.

This has been an invaluable opportunity to explore our future. It is imperative that architects conduct similar explorations. While there may be little place for direct application of this work, we feel it offers a substantive basis for future development and research. We have been true to our intentions. The project has been created for use, yet it cannot readily be consumed.



ARURAL



B/URBAN



CISUBURBAN

